EES 180. Computer Applications in Geology (3)
Use of computers in geology, focusing on such applications as multi-dimensional graphics, desktop mapping, communications, on-line resources, modeling. (2 lecture, 3 lab hours) (Formerly GEOL 180)

EES 185. Remote Sensing for the Natural Sciences (3)
Prerequisite: G.E. Breadth, Area B; GEOG 105 recommended. Introduction to remote sensing techniques, including ultraviolet, visible, and infrared electromagnetic sensors, both space and aircraft based, and acoustic methods. Laboratory exercises will use examples from geology, agriculture, and society. Familiarity with computers required. (2 lecture, 3 lab hours) (Formerly GEOL 185)

EES 186. Environmental GIS (3)
Prerequisite: GEOG 107 recommended. Spatial information management, analysis, interpretation, and display using computer methods. Map concepts, spatial relationships, database design, and spatial analysis of data. Laboratory exercises using geologic map data, faults, earthquake epicenters, stream habitats and restoration, and endangered species. Familiarity with computers required. (2 lecture, 3 lab hours) (Formerly GEOL 186)

EES 190. Independent Study (1-3; max total 6)
See *Academic Placement — Independent Study*. Approved for ***RP*** grading. (Formerly GEOL 190)

EES 199. Undergraduate Thesis (3)
Prerequisites: EES 102, 104, 106; senior standing. Independent research project in any geologic topic supervised by a faculty member and leading to completion of baccalaureate degree. (Formerly GEOL 199)

GRADUATE COURSES

(See *Catalog Numbering System*.)

Earth and Environmental Sciences (EES)

EES 201. Seminar in Geology (3)
Prerequisite: graduate standing. Seminar covering advanced and evolving topics in the earth sciences. Requirements include active discussion participation, frequent oral presentation, and written research papers. Satisfies Graduate Writing Skills requirement. (3 seminar hours) **S** (Formerly GEOL 201)

EES 202. Geology Laboratory Teaching Techniques (1)
Laboratory safety, lab lecture techniques, earth and environmental science activity design, equipment setups, student evaluation methods and grading, peer teaching assessment, leading field trips, etc. Primarily for teaching associates in geology. ***CR/NC*** grading only. (One 2-hour lab) (Formerly GEOL 202)

EES 210. Analysis of Faults and Earthquakes (3)
Prerequisites: EES 106 and 107. Includes plate tectonic theory; kinematics and dynamics of fracturing and faulting; formation and propagation of seismic waves; recognizing and quantifying seismic potential; remote sensing and geophysics in applied fault studies. Field projects and oral presentations required. (2 lecture, 3 lab hours) (Formerly GEOL 210)

EES 217T. Topics in Hydrogeology and Environmental Geology (2-3; max total 6 if no topic repeated)
Prerequisite: major in geology and/or permission of instructor. Studies of current issues and recent research topics which may include groundwater contamination, environmental pollution, and hazardous and nuclear waste management. Readings from books, journals, and government publications. Independent research and oral presentation required. Laboratory activities may be required. (Formerly GEOL 217T)

EES 220. Groundwater Hydrology (3)
Prerequisites: EES 117. MATH 77 recommended. Principles of flow through porous and fractured media; groundwater hydraulics in the saturated and unsaturated zones; contaminant transport; introduction to groundwater models. (2 lecture, 3 lab hours) (Formerly GEOL 220)

EES 230. Contaminant Transport (3)
Prerequisites: EES 117 or permission of instructor; MATH 76 and EES 178 recommended. A study of analytical methods to predict and draw maps of contaminant transport in water, air, and soil. MathCAD program are used to solve the governing equations of chemical diffusion, advection, and dispersion in the environment. (Formerly GEOL 217T)

EES 231. Depositional Systems (3)
Prerequisites: EES 102 and 105. Investigation of modern and ancient depositional systems. Field trip required. (2 lecture, 3 lab hours) (Formerly GEOL 231)

EES 232. Basin Analysis Seminar (3)
Prerequisites: EES 102 and 106. Topics may include: basin styles, tectonics and sedimentation, seismic stratigraphy, subsidence and thermal history, and petroleum plays. Research paper and oral presentation required. (Formerly GEOL 232)

EES 250T. Topics in Geology (1-3; may be taken more than once if no topic is repeated)
Prerequisite: major in geology and/or permission of instructor. Advanced studies of such areas as petrology, marine geology, and regional stratigraphy. Some topics may have labs and field trips. (Formerly GEOL 250T)

EES 251T. Topics in Engineering Geology (1-3; may be taken more than once if no topic is repeated)
Prerequisites: major or minor in geology; permission of instructor. Advanced studies in areas such as slope stability, ground water monitoring, drilling and core logging, water sampling, hazardous waste site investigations, and geophysical instrumentation. (Formerly GEOL 251T)

EES 271. Volcanology (3)
Prerequisite: EES 101. A study of volcanic activity, including classification, characteristics, products of eruptions, human interactions with volcanoes and related phenomena. Field trips required. (1 lecture, 6 lab hours) (Formerly GEOL 271)

EES 290. Independent Study (1-3; max total 6)
See *Academic Placement — Independent Study*. Approved for ***RP*** grading. (Formerly GEOL 290)

EES 299. Thesis (2-6; max total 6)
Prerequisite: See *Criteria for Thesis and Project*. Preparation, completion, and submission of an acceptable thesis for the master's degree. Approved for ***RP*** grading. (Formerly GEOL 299)